PALM Intranet

Application Number [ ] SEARCH

IDS Flag Clearance for Application 09822103

IDS Information

Content	Mailroom Date	Entry Number	IDS Review	Reviewer
M844	03-30-2001	6	☑	06-13-2001 19:54:46 EXPO-CONV

UPDATE

9/822/03

Refine Search

Your wildcard search against 10000 terms has yielded the results below.
Your result set for the last L# is incomplete.
The probable cause is use of unlimited truncation. Revise your search strategy to use limited truncation.
Search Results -

Terms	Documents
L7 and ((adjust$ or control$) with shift$ with (threshold$ or range)) and L10	6

Database: US Pre-Grant Publication Full-Text Database; US Patents Full-Text Database; US OCR Full-Text Database; EPO Abstracts Database; JPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L14

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Monday, December 19, 2005 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR			
L14	l7 and ((adjust$ or control$) with shift$ with (threshold$ or range)) and l10	6	L14
L13	L12 and 701/$.ccls.	11	L13
L12	l7 and ((adjust$ or control$) with shift$ with (threshold$ or range))	29	L12
DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR			
L11	L10 and l1	0	L11
L10	L9 or l8	382	L10
L9	L7 and @pd<=20000409	196	L9
L8	L7 and @ad<=20000409	382	L8
L7	((control$ with transmission$) same gps$)	1218	L7

L6	L2 and gps$5	1	L6
L5	L4 and gps$	0	L5
L4	5925087.pn.	1	L4
L3	L2 and gps	2	L3
L2	L1 and @ad<=20000409	23	L2
L1	701/?.ccls. and (vehicle or automobile) and ((adjust$ or control$ or chang$ or correct$ or determin$ or decid$) with shift$ with (threshold$ or range))	57	L1

END OF SEARCH HISTORY

L14: Entry 1 of 6 File: USPT Jun 10, 2003

DOCUMENT-IDENTIFIER: US 6577334 B1
** See image for Certificate of Correction **
TITLE: Vehicle control

Application Filing Date (1):
19990216

Brief Summary Text (5):
Recent navigation systems, mounted on a vehicle, induce the driver to drive along a predetermined drive route. Japanese patent publication No. 6-58141 discloses a vehicle control system that controls the transmission or other system on the vehicle in accordance with the road data stored in the navigation system. In the prior art vehicle control, the road data for a vicinity around the current position is read out from a memory in the navigation system. However, when the vehicle enters a junction at which a road branches off from the main road, the prior art is not capable of determining if the vehicle is still on the main road or on the branch road. Such a situation could occur, for example, when the vehicle enters a ramp onto a speedway or an exit branched off from the main road at an interchange. In the prior art, such an occurrence could not be confirmed until the vehicle had moved too far away from a main road which is detected by GPS (global positioning system) or other current position sensor means. The mode or manner of vehicle control, such as automatic transmission control, should preferably differ between travel on the main road and on a branch road. Delay in detection of road change results in failure of appropriate vehicle control to be executed immediately after the vehicle has entered a branch road.

Brief Summary Text (23):
In a typical embodiment, the control means controls a shift range of speeds or gear ratios in an automatic transmission.

Detailed Description Text (37):
A/T ECU 52 acts as a gear ratio control means which operates, in response to the deceleration demand supplied by navigation processing unit 11, to determine a gear ratio range to which the transmission is shiftable. For example, when the current transmission stage has a gear ratio greater than the shiftable range, A/T ECU 52 executes down-shift control.

Detailed Description Text (56):
As above described, each control device starts execution of control responsive to detection of some decelerating operation or initiation of some decelerating operation by the driver. By way of example, the automatic transmission control starts in response to detection that the accelerator pedal has been depressed so that the transmission is shiftable within a limited range of stages or gear ratios. Accordingly, when the current transmission stage is higher than the limited range, it is shifted down to the highest stage of the limited range.

Detailed Description Text (114):
The final decision thus obtained may be used for automatic transmission control in the following manner. In this embodiment, a shiftable range of transmission stages is determined by a command signal from navigation system 10. For example, even if

the transmission control device (A/T ECU 52) determines 4th speed, when the shiftable range determined by navigation processing unit 11 specifies the upper limit of 3rd speed, then the transmission stage to be finally determined should be 3.sup.rd.

CLAIMS:

16. A vehicle control system according to claim 1 wherein said control means controls a shiftable range of speeds or gear ratios in an automatic transmission.

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L14: Entry 1 of 6 File: USPT Jun 10, 2003

US-PAT-NO: 6577334
DOCUMENT-IDENTIFIER: US 6577334 B1
**** See image for Certificate of Correction ****

TITLE: Vehicle control

DATE-ISSUED: June 10, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kawai; Masao	Aichi-pref.			JP
Kimura; Keiichi	Aichi-pref.			JP
Aruga; Hideki	Aichi-pref.			JP

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
KabushikiKaisha Equos Research				JP	03
Aisin AW Co., Ltd.				JP	03

APPL-NO: 09/250709 [PALM]
DATE FILED: February 16, 1999

PARENT-CASE:
This application claims, under 35 USC 119, priority of Japanese Application No. 10-230255 filed Aug. 1, 1998 and Japanese Application No. 10-54533 filed Feb. 18, 1998.

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	10-054533	February 18, 1998
JP	10-230255	August 1, 1998

INT-CL: [07] H04 N 7/18

US-CL-ISSUED: 348/148
US-CL-CURRENT: 348/148

FIELD-OF-SEARCH: 348/148, 348/118, 348/119, 701/23, 701/28, 701/41, 701/82, 701/93, 701/24, 701/117, 701/44, 701/211, H04N 718, H04N007/18

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5245422	September 1993	Borcherts et al.	348/119
☐	5483453	January 1996	Uemura et al.	364/424.02
☐	5485378	January 1996	Franke et al.	364/424.05
☐	5999877	December 1999	Takahashi et al.	701/117
☐	6035253	May 2000	Hayashi et al.	701/211

ART-UNIT: 2713

PRIMARY-EXAMINER: Diep; Nhon

ATTY-AGENT-FIRM: Lorusso, Loud & Kelly

ABSTRACT:

A vehicle control system includes a road data memory, current position sensor that detects a current position of a vehicle and a camera that takes a picture of the road ahead of the current position. At least one indicator line such as a lane dividing line on the road is shown in the picture. The picture changes as the vehicle moves forward along the road, during which increase in width of the indicator line or increase of distance between two indicator lines may be detected. By such detection, the vehicle position with respect to the indicator line is determined, the result of which is incorporated into control operation of an automatic transmission, for example.

21 Claims, 34 Drawing figures

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L14: Entry 4 of 6 File: USPT May 30, 2000

US-PAT-NO: 6070118
DOCUMENT-IDENTIFIER: US 6070118 A
**** See image for Certificate of Correction ****

TITLE: Transmission control system using road data to control the transmission

DATE-ISSUED: May 30, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ohta; Takashi	Toyota			JP
Iwatsuki; Kunihiro	Toyota			JP
Fukumura; Kagenori	Toyota			JP

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Toyota Jidosha Kabushiki Kaisha	Toyota			JP	03

APPL-NO: 08/810472 [PALM]
DATE FILED: March 4, 1997

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	8-087208	March 15, 1996
JP	8-087209	March 15, 1996
JP	9-015880	January 13, 1997

INT-CL: [07] F16 H 61/02

US-CL-ISSUED: 701/65; 701/56, 477/97
US-CL-CURRENT: 701/65; 477/97, 701/56

FIELD-OF-SEARCH: 701/55, 701/56, 701/65, 701/59, 701/208, 477/97, 477/34, 477/78

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5157609	October 1992	Stehle et al.	364/424.1
☐	5315295	May 1994	Fujii	340/936

☐	5361207	November 1994	Hayafune	364/424.1
☐	5506578	April 1996	Kishi et al.	340/996
☐	5514050	May 1996	Bauerle et al.	479/118
☐	5661650	August 1997	Sekine et al.	364/424.027
☐	5716301	February 1998	Wild et al.	477/97
☐	5832400	November 1998	Takahashi et al.	701/53

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
752548 A2	January 1997	EP	
766024 A2	April 1997	EP	
43 37 163	May 1994	DE	
195 28 625	February 1997	DE	
4-285364	October 1992	JP	
5-322591	December 1993	JP	
6-135349	May 1994	JP	
6-58141	August 1994	JP	
6-272753	September 1994	JP	
7-85392	March 1995	JP	
7-192194	July 1995	JP	
8-72591	March 1996	JP	
8-82365	March 1996	JP	

OTHER PUBLICATIONS

Patent Abstracts of Japan, vol. 12, No. 182 (M-702), May 27, 1988, JP 62-292947, Dec. 19, 1987.
A. Bastian, et al., Proceedings of the International Conference on Fuzzy Systems, International Joint Conference of the 4.sup.th International IEEE Conference on Fuzzy Systems and the 2.sup.nd International Fuzzy Engineering Symposium, vol. 2, pp. 1063-1070, Mar. 20, 1995, "System Overview and Special Features of Fate: Fuzzy Logic Automatic Transmission Expert System".
Andreas Bastian, Vehicle System Dynamics, vol. 24, No. 4/05, pp. 389-400, Jun. 1, 1995, "Fuzzy Logic in Automatic Transmission Control".
Patent Abstracts of Japan, vol. 18, No. 135 (P-1705), Mar. 7, 1994, JP 5-322591, Dec. 7, 1993.
Patent Abstracts of Japan, vol. 95, No. 10, Nov. 30, 1995, JP 7-192194, Jul. 28, 1995.

ART-UNIT: 361

PRIMARY-EXAMINER: Zanelli; Michael J.

ATTY-AGENT-FIRM: Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

ABSTRACT:

A control system for a transmission, comprises a shift control function to output a

shift instruction signal on the basis of a predetermined shift pattern and a road data detecting function to detect the road data of a route to be followed by a vehicle. This control system further comprises a start detecting function to detect the start of the vehicle; and a shift pattern control function to set a shift pattern for a curve, as having a control content for making it liable to set a larger gear ratio, as the shift pattern when the vehicle start is detected by the start detecting function and when a curved road is detected in the route to be followed, by the road data detecting function.

18 Claims, 42 Drawing figures

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L14: Entry 4 of 6 File: USPT May 30, 2000

DOCUMENT-IDENTIFIER: US 6070118 A
**** See image for Certificate of Correction ****
TITLE: Transmission control system using road data to control the transmission

Application Filing Date (1):
19970304

Detailed Description Text (31):
FIG. 3 shows an example of the control at the starting time on a curved road. At first Step 1: the present position of the vehicle is located by the navigation system 20; the present position and the coming road situations are specified; and the control of the automatic transmission 2 is executed by the basic pattern. Here, the present position of the vehicle can be located, as customary, by the aforementioned dead reckoning navigation or GPS. Moreover, the road situations can be specified on the basis of the data, as stored in the navigation system 20, and the data as obtained from the aforementioned ground data transmission system 43. Incidentally, the road ahead of the present position can be specified by inputting the destination to set the route to be followed. Alternatively, the coming road can be judged from either the route followed just before or the map data. Moreover, the basic shift pattern can be executed as the shift patter by reading the pattern stored as the shift diagram, for example.

Detailed Description Text (67):
When the vehicle is to run on a curved road, a gear stage for effecting the engine braking is desirably used to prevent a transverse acceleration (or transverse G) from becoming excessive and to improve the accelerability at the instant when the curved road is passed. This control can be executed by controlling the shift by using a shift diagram having a wide low speed range for effecting the engine braking, for example. This is a control for inhibiting or suppressing an upshift to a gear stage on a higher speed side such as an overdrive stage and is similar to that for the upslope/downslope. Therefore, when a curved road and an upslope/downslope are mixed, the control system of the present invention performs the control in the following manner.

Detailed Description Text (221):
The means for setting a shift pattern for an intermediate straight road in the control system including the eighth featuring construction of the present invention can be the means for releasing the downslope control temporarily. Moreover, the means for setting the intermediate straight road shift pattern in the control system including the eighth featuring construction can be the means for changing the threshold value for deciding the downslope.

L14: Entry 5 of 6 File: USPT Nov 3, 1998

US-PAT-NO: 5832400
DOCUMENT-IDENTIFIER: US 5832400 A

TITLE: Controlling vehicular driving force in anticipation of road situation on which vehicle is to run utilizing vehicular navigation system

DATE-ISSUED: November 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Takahashi; Hiroshi	Tokyo			JP
Kidokoro; Hitoshi	Yokohama			JP
Shiratori; Akira	Yokohama			JP

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Nissan Motor Co.., Ltd.	Kanagawa			JP	03

APPL-NO: 08/523096 [PALM]
DATE FILED: September 1, 1995

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	6-235867	September 5, 1994

INT-CL: [06] B60 K 31/04

US-CL-ISSUED: 701/53; 701/58, 701/65
US-CL-CURRENT: 701/53; 701/58, 701/65

FIELD-OF-SEARCH: 364/424.082, 364/424.083, 364/424.084, 364/424.085, 364/424.087, 364/424.094, 364/431.04, 364/431.051, 364/431.054, 701/53, 701/54, 701/55, 701/56, 701/58, 701/65, 701/102, 701/103, 701/106

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4380048	April 1983	Kishi et al.	364/424.082
☐	4630508	December 1986	Klatt	364/424.083

☐	4743913	May 1988	Takai	
☐	4899285	February 1990	Nakayama et al.	
☐	5371678	December 1994	Nomura	
☐	5410477	April 1995	Ishii et al.	364/431.04
☐	5419207	May 1995	Kobayashi et al.	

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
2-48210	February 1990	JP	
2-194406	August 1990	JP	
2-231611	September 1990	JP	
2-310800	December 1990	JP	
3-182841	August 1991	JP	
4-218435	August 1992	JP	

ART-UNIT: 364

PRIMARY-EXAMINER: Cuchlinski, Jr.; William A.

ASSISTANT-EXAMINER: Pipala; Edward

ATTY-AGENT-FIRM: McDermott, Will & Emery

ABSTRACT:

In an apparatus and method utilizing a navigation system for controlling a driving force to be exerted at an estimated position at which the vehicle is to pass to reach to a destination at which the vehicle is finally to reach, a running road estimating block estimates a future position of the own vehicle in which the vehicular driving force controlling apparatus is mounted on the basis of a present position of the own vehicle. The estimated future position is a point of a road for the vehicle to pass several seconds after a time at which the own vehicle is placed at the present position specified from a recorded content of an electronic road map stored in, for example, CD-ROM. A driving force predicting block determines a present vehicular load state derived by a running resistance measuring block as a required driving force at the estimated position by correcting the present vehicular load state by a height difference between the estimated position and the present position. A driving system controlling block changes a setting of an engine and/or automatic power transmission according to a magnitude of the required driving force at the present position.

26 Claims, 26 Drawing figures

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L14: Entry 5 of 6 File: USPT Nov 3, 1998

DOCUMENT-IDENTIFIER: US 5832400 A
TITLE: Controlling vehicular driving force in anticipation of road situation on which vehicle is to run utilizing vehicular navigation system

Application Filing Date (1):
19950901

DATE ISSUED (1):
19981103

Brief Summary Text (7):
For example, when a vehicular sensing apparatus detects a high-speed steady-state running (so called, cruise speed run) during the vehicle run on a freeway, the automotive engine is controlled in a high air-fuel mixture ratio mode, namely, in a lean burn control mode and/or a gear range shifting characteristic of the associated automatic power transmission is changed to a higher gear range shifting characteristic mode or lower gear range shifting characteristic mode from a normal gear range shifting mode in order to accommodate to an output condition of the engine.

Brief Summary Text (25):
The above-described object can also be achieved by providing a method for controlling a driving force exerted by an automotive vehicle, comprising the steps of: a) storing a road map information, said road map information including at least a gradient information of roads; b) specifying a present position of the vehicle using a GPS receiving system; c) referring to the stored road map information on the basis of a result of specification of the present position of the vehicle at the step b) so as to derive a present position of the vehicle on the road map information, and estimating a future position of the vehicle as an estimated position of the vehicle or the basis of the derived present position of the vehicle, said estimated position of the vehicle being the future present position of the vehicle several seconds after a time at which the vehicle is placed at the present position; d) deriving a vehicle load condition imposed on a vehicular driving system at the specified present position of the vehicle; e) correcting the present vehicular load condition at the present position of the vehicle so as to derive a required driving force at the estimated position of the vehicle on the basis of the gradient information between the present position of the vehicle and the estimated position of the vehicle searched from the step a); and f) adjusting a setting of a driving characteristic of at least one of a vehicular engine or engine associated automatic power transmission installed in a vehicle driving system in advance on the basis of the derived driving force at the estimated position of the vehicle so as to suppress a fuel consumption as low as possible within a range such that the fuel consumption enables the vehicular driving system to exert the required driving force at the estimated position of the vehicle.

Brief Summary Text (26):
In the vehicular driving force controlling apparatus according to the present invention, the electronic road map, the own vehicle position specifying means, and running road estimating means constitute a navigating system. The electronic road map includes at least gradient information for each point of place on the road

segments as an attribute information on the road map information. The gradient information includes a height (land height) information by which the gradient of the running road segment can indirectly be identified. The position detecting means is constituted by a combination of a gyro sensor (gyroscope) and a running distance sensor or GPS (Global Positioning System) satellite broadcasting receiver. The running road estimating means executes an estimation operation for the future vehicular position several second after the present position on the basis of the derived present position of the vehicle in addition to the specification operation of the present vehicular position in the same way as the well known navigating system executes. The driving force predicting means executes a relative correction for the driving force according to a gradient difference between the present position and the estimated position on the basis of actual driving system load condition and driving force output condition of the vehicle itself at the present position of the vehicle. Therefore, it is not necessary to search for the equal variables between the present position and the estimated position such as the quantity of cargo mounted on the vehicle (vehicle load weight), the number of vehicular occupants, road wheel condition, running road surface condition, and so forth so that an accurate estimation of a required driving force becomes possible even if the above-described variables are unknown. The driving system controlling means optimizes an engine air-fuel mixture ratio and/or gear range shifting characteristic of the automatic power transmission according to the load condition at the estimated position (which is replacable with an average value or a maximum value of the load condition at an interval of distance from the present position to the estimated position) which is relatively derived by the driving force predicting means from the anticipated information. The optimization means the achievement of improvement in the fuel economy, purification of exhaust gas, and so forth avoiding unnecessary switching operations in a range for the vehicular driver not to feel the insufficiency of driving power and the worsening in acceleration command responsive characteristic. It is noted that the estimated position means a point of place through which the vehicle is to pass several seconds after the vehicle has run through the present position. It is also noted that the several seconds after the vehicle has run through the present position means a time duration equal to or more than a delay time (time lag) from a time at which the signal to indicate the setting change for the engine and/or automatic power transmission of the vehicle is input to a time at which the result of setting change is actually reflected on the output of the driving system (driving power train) of the vehicle. Hence, the interval of distance between the present position and the estimated position may be varied according to the instantaneous vehicle running speed. The required driving force at the estimated position may be corrected according to such an information as a kind of road (freeway or national roadway), radius of curvature, and so forth searched from the electronic road map in addition to the gradient difference between the present position and estimated position. The running road estimating means, the running resistance measuring means, the driving force predicting means, driving system controlling means correspond to the processing of data calculations, comparison, and determination so that it is possible for theses means to correspond to a part of program to be executed by one or more arithmetic operation units including a memory unit in the practical manner.

Detailed Description Text (38):
The required driving force f(x) is different depending upon how far is the estimated position x away from the present position P, i.e., the distance between the present position and the estimated position. The reason that a control target f (x) of the driving force is set in an anticipation read of the electronic road map 12 is that it takes a time to operate the switching of the settings of the engine driving characteristic and automatic power transmission and it is not in time to perform the switchings at a time when the future situation has be noticed. For example, in a case where the switching from a lean control mode to a stoichiometric control mode as a lean burn condition is carried out, it takes about two seconds. In a case where to perform the switching of the gear range shifting characteristic of the torque converter equipped stepwise gear range shifting automatic power

transmission about one second is required. Hence, if the required setting changes are started with the driving force f(x) at the estimated position x about two second ahead of the present position P, the anticipation control is achieved so that the vehicular driver is not aware of a delay in control. In a case where the vehicle runs at a speed of 100 km/h, the estimated position x is 30 through 60 meters ahead of the present position since the vehicle runs about 30 seconds per second. In the anticipation control anticipating a temporary halt at an intersection or at a signal, it is convenient to be enabled to anticipate 100 meter through 200 meter ahead. If the temporary halt at the forward direction is assured, the engine can be in the lean control mode and the automatic power transmission gear range shift can be inhibited since the vehicle can be predicted to move in an inertial run.

Detailed Description Text (49):
FIG. 7 shows a gear range shifting characteristic in the associated automatic power transmission having the torque converter and a lock-up control. As shown in FIG. 7, the switching timings are shown in which a first speed range G1, a second speed range G2, a fourth speed range G4 are provided in its order with respect to the vehicle velocity. It is noted that a timing at which the gear shift is transferred from the third gear shifting range G3 to the fourth gear shifting range G4 is selectable from three modes, namely, a high-geared characteristic, a normal characteristic, and a low-geared characteristic. The high-geared characteristic is such that a gear of a lower gear shift ratio is switched before the opening angle of the accelerator (throttle valve) becomes large and an automatic gear shift is executed having a higher priority of the suppression of the engine revolution speed than the engine output power. On the other hand, the lower geared characteristic is such that a higher gear shift ratio is used until the engine revolution speed is considerably high and, thus, a horse power (engine output power can be taken out. The normal characteristic gives an intermediate characteristic of both higher geared and lower geared characteristics.

Detailed Description Text (53):
First, at a step 111, the driving system controlling block 16 (constituted by a CPU and hereinafter called CPU) determines the present control mode of either the lean control mode or the stoichiometric control, the present gear range shifting characteristic of any one of the lower-geared characteristic, the normal characteristic, or the higher-geared characteristic, and whether the torque converter is in the locked-up (engaged) state.

Detailed Description Text (60):
In the driving force controlling apparatus in the first embodiment, the driving force at a vehicular passing point several seconds after the present position is estimated so that the settings of the driving characteristics of the engine 27 and automatic power transmission 28 are adjusted in anticipation. Thus, the vehicular driver is not aware of the delay in operation for the settings which require considerable times to operate the shifting of the control modes and shiftings of the gear range shifting characteristics. Since the driving force several seconds after the present passing point can be derived relatively from the present actual driving force and the anticipated road gradient difference, it is not necessary to measure the parameters contributing largely to the running resistance such as the number of vehicular occupants, engine's characteristic variation due to the aging effect, the atmospheric pressure, and road wheel wear-out condition. In addition, since the anticipated distance to the estimated position is varied according to the running road situations and, when the vehicle approaches to the traffic intersection, the more future anticipation of the estimated position is temporarily halted until the forward direction is ascertained, the possibility of the advance control of the driving force due to an erroneous forward direction is extremely reduced. Furthermore, since the driving forces are estimated and are averaged (for example, using the moving average) at the plurality of positions from among the anticipated distances of the estimated positions about 100 meters ahead of the

present positions, the estimation accuracy of the driving force can be higher than those case derived at a single estimated position and the number of times changes in the settings of the driving characteristics of the engine and automatic power transmission are carried out can be minimized.

Detailed Description Text (74):
The required driving force FF(x) is defined as the required driving force several seconds after the time at which the vehicle has passed the present position. The driving system controlling block 16B adjusts the setting of the engine air/fuel mixture ratio controlling modes, gear range shifting characteristic of the automatic power transmission, and the locked-up state of the torque converter using thus derived required driving force FF(x). The driving system controlling block 16B changes the setting of the air/fuel mixture ratio control modes and gear range shifting characteristics of the automatic power transmission several seconds before reaching to the estimated position so that the fuel consumption is suppressed in a range which can cope with the required driving force FF(x).

Detailed Description Text (83):
Thereafter, the routine goes to a step 139 in which the moving average value of the presently generated driving force (generated driving force T) is compared with the moving average value (estimated driving force X) of the estimated driving force at the forward interval of distance. If X>>T (the estimated moving averaged driving force X is considerably larger than the generated moving averaged driving force T) at the step 139, the routine goes to a step 141 in which the engine 37 is in the stoichiometric control mode and the gear range shifting characteristic of the automatic power transmission 28 is changed to the normal characteristic so as to take a higher priority for securing the output power.

Detailed Description Text (100):
(6) If the result of comparison between the generated driving force T and estimated driving force is X>>T, the automatic power transmission gear range shifting characteristic is transferred to the normal characteristic from the higher geared range shifting characteristic when the higher geared range shifting characteristic is being carried out and is transferred to the lower geared shifting characteristic when it is in the normal characteristic in addition to the halt of engine lean burn control mode. Thus, such a situation that the insufficient, acceleration characteristic of the driving system can be avoided when the vehicle ascends a steep gradient slope.

Detailed Description Text (154):
For example, when it is determined that the past velocity at the point of location x at the forward ascending slope is low, the engine lean burn control mode remains unchanged for the run in the traffic congestion and for the cruise speed run and the gear range shift switching characteristic of the automatic power transmission is at the higher geared range shifting characteristic in place of the halt of the lean burn air/fuel mixture ratio control mode so as to accommodate the ascending slope and setting of the switching characteristic of the lower geared range shifting characteristic.

Detailed Description Text (174):
Next, suppose that in a case where the vehicle runs on the same road as shown in FIG. 14 at the next time, the vehicle is now at the position P. The running road estimating block 13G searches the point of road x from the rewritable electronic road map 12G to anticipate the point of road x and reads the height information therefrom. At the same time, the running road estimating block 13G reads the average value between the actual value and predicted value of the driving forces and its standard deviation when the vehicle has run at the previous time of run. If this average value and the standard deviation are relatively large, the driving situations are often varied so that it is estimated that it is the driving state which is difficult for the driving force to be predicted. In this case, even if the

road in the forward direction is flat, the driving system controlling block 16G does not adopt the lean burn air/fuel mixture ratio control mode and the higher geared shifting characteristic but selects the normal settings, namely, the stoichiometric air/fuel mixture ratio control mode and the normal characteristic of the gear range shifting characteristic of the automatic power transmission.

Detailed Description Text (201):
That is to say, the driving system controlling block 16H sets the engine air/fuel mixture ratio control mode to the stoichiometric air/fuel mixture ratio control mode and sets the gear range shifting characteristic to the normal characteristic. In addition, in a case where the present control target content is largely different from the control target content corresponding to the normal setting content and the deterioration in the driveability, on the contrary, is considered due to the abrupt change in the settings, a temporal setting change is reserved and the contents of the controls are switched when the driver operates the accelerator so that the valve opening angle is returned to zero. In this case, if the driver does not yet release the accelerator to fully close the throttle valve, the driving system controlling block 16H changes, for the time being, the control target to the normal control target so that the control based on the anticipation of the height information is halted for a predetermined period of time.

CLAIMS:

3. A control apparatus for an automotive vehicle as claimed in claim 1, wherein said driving system controlling means comprises vehicular driving system total controlling means for selecting any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air-fuel mixture ratio of the engine and a gear range shifting characteristic of the automatic power transmission, and for adjusting a modification timing of the settings of the combinations so as to secure a continuity in a driveability of the vehicular driving system, thus, performing a total control over the vehicular driving system.

5. A control apparatus for an automotive vehicle as claimed in claim 4, wherein said driving system controlling means comprises vehicular driving system total controlling means for selecting any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air-fuel mixture ratio of the engine and a gear range shifting characteristic of the automatic power transmission, and for adjusting a modification timing of the settings of the combinations so as to secure a continuity in a driveability of the vehicular driving system, thus, performing a total control over the vehicular driving system.

7. A control apparatus for an automotive vehicle as claimed in claim 6, wherein said driving system controlling means comprises vehicular driving system total controlling means for selecting any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air-fuel mixture ratio of the engine and a gear range shifting characteristic of the automatic power transmission, and for adjusting a modification timing of the settings of the combinations so as to secure a continuity in a driveability of the vehicular driving system, thus, performing a total control over the vehicular driving system.

9. A control apparatus for an automotive vehicle as claimed in claim 8, wherein said driving system controlling means comprises vehicular driving system total controlling means for selecting any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air-fuel mixture ratio of the engine and a gear range shifting characteristic of the automatic power transmission, and for adjusting a modification timing of the settings of the combinations so as to secure a

continuity in a driveability of the vehicular driving system, thus, performing a total control over the vehicular driving system.

12. A control apparatus for an automotive vehicle as claimed in claim 11, wherein said driving system controlling means comprises vehicular driving system total controlling means for selecting any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air-fuel mixture ratio of the engine and a gear range shifting characteristic of the automatic power transmission, and for adjusting a modification timing of the settings of the combinations so as to secure a continuity in a driveability of the vehicular driving system, thus, performing a total control over the vehicular driving system.

14. A control apparatus for an automotive vehicle as claimed in claim 13, wherein said driving system controlling means comprises vehicular driving system total controlling means for selecting any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air-fuel mixture ratio of the engine and a gear range shifting characteristic of the automatic power transmission, and for adjusting a modification timing of the settings of the combinations so as to secure a continuity in a driveability of the vehicular driving system, thus, performing a total control over the vehicular driving system.

24. A method for controlling a driving force exerted by an automotive vehicle as claimed in claim 15, wherein, at said step f), a total control of the driving system of a vehicle is carried out such that any one of a plurality of combinations which corresponds to the required driving force, the combinations including a combination between an air/fuel mixture ratio of an engine of the vehicular driving system and a gear range shifting characteristic of an engine associated automatic power transmission, and a modification timing of the settings of the combinations is adjusted in advance in time so as to secure a continuity in a driveability of the vehicular driving system.

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☐ 1. Document ID: US 6577334 B1

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L14: Entry 1 of 6 File: USPT Jun 10, 2003

US-PAT-NO: 6577334
DOCUMENT-IDENTIFIER: US 6577334 B1
** See image for Certificate of Correction **

TITLE: Vehicle control

DATE-ISSUED: June 10, 2003

INVENTOR-INFORMATION:

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Kimura; Keiichi	Aichi-pref.			JP
Aruga; Hideki	Aichi-pref.			JP

US-CL-CURRENT: 348/148

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

☐ 2. Document ID: US 6273771 B1

L14: Entry 2 of 6 File: USPT Aug 14, 2001

US-PAT-NO: 6273771
DOCUMENT-IDENTIFIER: US 6273771 B1

TITLE: Control system for a marine vessel

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

☐ 3. Document ID: US 6151354 A

L14: Entry 3 of 6 File: USPT Nov 21, 2000

US-PAT-NO: 6151354
DOCUMENT-IDENTIFIER: US 6151354 A

TITLE: Multi-mode, multi-band, multi-user radio system architecture

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

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☐ 4. Document ID: US 6070118 A

L14: Entry 4 of 6 File: USPT May 30, 2000

US-PAT-NO: 6070118
DOCUMENT-IDENTIFIER: US 6070118 A
**** See image for Certificate of Correction ****

TITLE: Transmission control system using road data to control the transmission

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

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☐ 5. Document ID: US 5832400 A

L14: Entry 5 of 6 File: USPT Nov 3, 1998

US-PAT-NO: 5832400
DOCUMENT-IDENTIFIER: US 5832400 A

TITLE: Controlling vehicular driving force in anticipation of road situation on which vehicle is to run utilizing vehicular navigation system

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

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☐ 6. Document ID: US 5068656 A

L14: Entry 6 of 6 File: USPT Nov 26, 1991

US-PAT-NO: 5068656
DOCUMENT-IDENTIFIER: US 5068656 A

TITLE: System and method for monitoring and reporting out-of-route mileage for long haul trucks

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

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Terms	Documents
L7 and ((adjust$ or control$) with shift$ with (threshold$ or range)) and L10	6

L3: Entry 1 of 2 File: USPT Sep 28, 1999

US-PAT-NO: 5957982
DOCUMENT-IDENTIFIER: US 5957982 A

TITLE: Method and system for space navigation

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

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PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL

☐	5109346	April 1992	Wertz	701/13
☐	5528502	June 1996	Wertz	701/13
☐	5717404	February 1998	Malla	342/352

ART-UNIT: 361

PRIMARY-EXAMINER: Cuchlinski, Jr.; William A.

ASSISTANT-EXAMINER: Beaulieu; Yonel

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ABSTRACT:

A method that allows a space vehicle to determine navigation information represented by the contents of a state vector. The method includes the steps of intermittently receiving navigation signals, initializing the state vector with an estimate of the navigation information, and generating a predicted state vector that represents the predicted values for the navigation information after a predetermined time increment in the future. The method further determines whether a navigation signal has been received within a predetermined window of time from a navigation beacon. If a navigation signal has been received, the method updates the state vector and the contents of the state vector are propagated forward in time to provide an estimate of the navigation information after a predetermined time increment. In some instances, however, a navigation signal is not received within the predetermined window of time. In such situations, the method simply propagates the contents of the predicted state vector forward in time. Thus, the predicted state vector maintains an estimate of the current navigation information even in the absence of a navigation signal.

26 Claims, 6 Drawing figures

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